

SANITATION SOLUTION

SEPTIC TANK INSTALLATION



PRE-INSTALLATION

Choose a tank

The volume required will depend on how often the tank will be pumped out and how many people will use the facilities on a daily basis.

To estimate what size is required:

Hand/Face wash \pm 1 - 4 L	\pm 1 - 4 L
Toilet flush \pm 3 - 7 L	\pm 3 - 7 L
Bath \pm 50 - 150 L	\pm 50 - 150 L
5 min shower \pm 80 L	\pm 80 L
5 kg laundry \pm 80 L	\pm 80 L

Note: This is a guideline for a basic installation. Each installation will vary based on the setup and personal preference. It is advised to make use of a professional for an installation this complex. A conservancy system requires two crucial components to function properly, the tank itself and a sludge pump/honey-sucker to pump out the contents once the tank is full.

A conservancy tank presents the opportunity of disposing of both black and greywater as it is chemical resistant. The waste inside the tank is pumped out by licensed hauling companies with adequate equipment who transport it to sewage facilities or dispose of it according to current legislation.

Tank placement

The location of a septic/conservancy tank should be considered and it must be placed on soil with a capacity greater than 120 kPa.

Avoid installing the tank

- In water saturated clay or an area that is frequently flooded
- Where depth to bedrock is less than 2.5m
- In the path of vehicles/heavy equipment
- Where underground services are expected (i.e. electric cables, water and sewer pipes, gas lines, etc.) If bearing capacity cannot easily be determine use the provided method of soil classification which will also assist in determining suitable backfill material.

Soil Classification Table - Which soil is suitable?

Rock	✓	Coarse-grained soil Gravel	✓
Sand	✓	Fine-grained soil Silt	✗
Clay	✗	Highly organic soil	✗

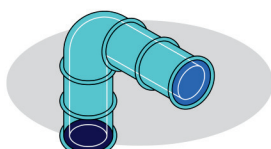
You will require the following:

1. Tank Underground/conservancy tank - size as required.
2. Pipes - 110 mm SV pipes Lengths will vary based on installation. 2a. From feed from house to the first elbow 2b. From first elbow to elbow extending out of the tank
3. Elbow - 110 mm According to pipes

Basic Requirements



A Makoro Septic Tank



110mm Elbow



110mm SV Pipe



Excavation

Fine sand, silt or clay	Min 420mm / max 720mm deeper than the tank's height
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No ground water will affect the tank- No traffic will pass over the site	Min 120mm / max 720mm deeper than the tank's height
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Ground water will affect the tank - Traffic will pass over the site	Min 420mm / max 720mm deeper than the tank's height
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Preparing the Tank Bed after excavation

Type

Rocks/Rocky Soils

Thickness

Minimum 150mm crusher dust or a coarse sand/gravel mixture - Bedding to be thicker where hollows or uneven areas are levelled out

Dry Installation Gravel /Coarse Sand (no ground water)	150mm crusher dust or a coarse sand/gravel mixture - Stabilise bedding layer with 3% cement (11/2 bags 50kg cement)
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Dry Installation Soft in-situ soil - fine sand. silt or clay (no ground water)	2 x layers of 150mm crusher dust or a coarse sand/gravel mixture each - Stabilise bedding layer with 3% cement (11/2 bags 50kg cement)
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Allow between 300mm to 600mm on all sides of the tank. Use the table provided to assist with the appropriate excavation depth relative to the setup.

Process

- Remove all large/loose rocks and objects that could interfere - Spread cement evenly and compact, using mechanical compactor
- Do not wet cement, as the natural moisture from the ground will do this over time - If the soil is too dry to form a lump when pressed in your hand, add a little water but ensure lump still crumbles when lightly touched
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Mon-Fri 8.00 AM - 17.00 PM
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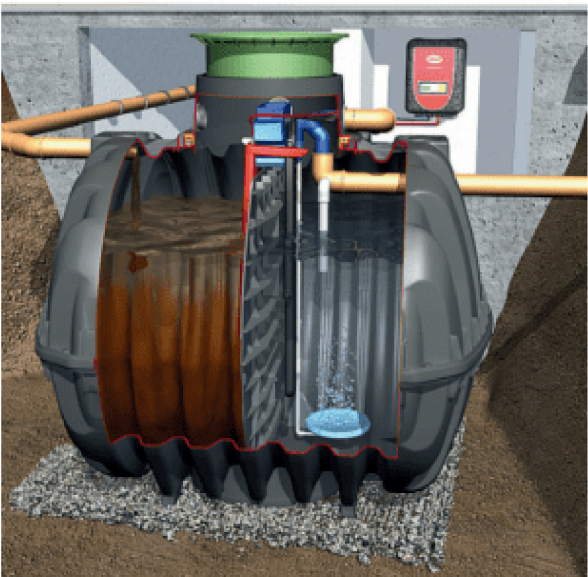
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INSTALLATION

System Components

1. Drill hole for inlet:

Drill a hole in the designated area (see image above) with 111mm hole saw or a jig saw for pipe to enter at the top of the tank.

2. Inlet connection:

Fit pipe and elbow to inlet and seal with window putty or pan connector sealer to ensure no leakage once final installation is complete.

3. Place the tank:

Carefully place the tank on top of the prepared bedding in the designated excavated area. Note: the direction of flow (inlet) and place according to setup.

4. Backfill preparation:

Suitable backfill material would be:

- Coarse River Sand
- Sand/Gravel Mixture (with no particles larger than 20mm and at least 50% of particles smaller than 5mm)

Note: Proper backfill material is critical. Refer to ‘pre-installation’ for more detail. **NB:** the backfill procedure differs based on the size of the conservancy tank used. It is vital to follow the correct procedure to ensure the tank does not get damaged (see steps 5 to 6).

5. Backfill for 6000L tank:

Fill the tank with 150mm of water, then backfill 150mm around the perimeter of the tank. Compact the layer and repeat the process until at least half of the hole is filled.

Backfill for 1250L-2500L - For the smaller range - fill the entire tank with water, then backfill in layers of 150mm around the perimeter of the tank, compacting each layer before laying the next. Continue until halfway.

6. Test compaction:

How to test if properly compacted: Drop a hardwood pick handle from about 300mm onto the compacted soil, it should make a ‘ping’ sound. Note: If the pick handle makes a dull sound the soil is not yet properly compacted Proper compaction is 97% Mod. AASHTO Before commencing with the rest of the installation, it is vital to ensure that the soil is properly compacted.

7. Fill lid with concrete:

Fill tank lid with concrete (allow concrete to cure) and put the lid in place. PART 2

8. Plumbing house to tank:

Connect feed from house (black and grey water) to the elbow extending from the inlet at the top of the tank. It is advised to make use of a local plumber to handle all plumbing requirements.

9. Backfill 2nd half:

Backfill the rest of the hole with suitable backfill material. Refer to steps 5 to 6 to ensure correct procedure is followed (depending on the size of the tank).

Recommendation:

Installing a manhole enables you to: a Pump out the content when/as needed without hassle. b Easily access the tank for maintenance purposes when necessary. Suitable material and correct installation is key to ensure proper functionality. It is advised to install a manhole for easy access when necessary.

Recommendation

Locating a local hauling company in advance will:

- Ensure you are prepared once your tank is full.
- Avoid any unnecessary delays and difficulties whilst making arrangements (as that has already been done). Find a local licensed hauling company and keep their contact details at hand.



Dressing:

Location

Wet Installation

Non-Load bearing

Load bearing

Description

Ground water present

No ground water will affect the tank - No traffic will pass over the site

Traffic will pass over the site

The dressing over the tank will depend on various conditions. Use the table above to assist with the appropriate dressing relative to the setup.

Type & Thickness

Compression ballast - 450mm (prevents tank from floating when empty)

Soil - Minimum 200 mm / maximum 750 mm

Concrete Slab - 150mm (necessary if vehicles will drive over the tank)

Excavation Depth

Pour 2.8m³ grade 20 MPa concrete on top of the tank (slump around 80). This will give a ballast +- 450mm thick over the entire area of the tank

Shape the soil over the top of the tank to ensure positive drainage

The slab should be 4.2m x 2.9 m and made with 25 MPa concrete, consisting out of two layers



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